

Remarks/Arguments

By way of the present amendment, Applicant has amended the specification to correct inadvertent typographical errors. Applicant has also amended Claims 1 and 10 to clarify the invention. Fourteen (14) claims remain pending in the application: Claims 1-7 and 10-16, of which Claims 1 and 10 are independent. Claims 8 and 9 were previously withdrawn. Applicant respectfully requests reconsideration of the pending claims, in view of the amendments above and comments below.

Claim Rejections

The Examiner rejected Claims 1-7 and 10-16 under 35 U.S.C. 103(a) as being unpatentable over Crowe et al (Patent No. 6,944,503). The Examiner stated that:

Crow teaches a device for applying neural stimulation in an amount to produce stimulation (column 4 line 65-57). Although he does not explicitly teach determining the amount of charge, in his background section he notes that the amount of charge varies for different nerves and depends upon how the pulse is applied (column 4 lines 1-11). To have used his techniques to determine the amount of charge and the best application pulse would have been obvious.

This rejection is respectfully traversed. Applicant acknowledges that the Crowe et al., reference (6,944,503), discloses a neural stimulation device that applies stimulation in an amount to produce stimulation. Crowe et al. teach doing this by providing a circuit configuration wherein each electrode may be an anode, a cathode or neither, see e.g., FIGS. 9-11 and accompanying text, and wherein constant current is shared between multiple electrodes (i.e., so that the current flowing through any given electrode may be all of the constant current, or just a fraction of the total current) so that the current flowing to or from at any given electrode may be made large or small to thereby stimulate or not stimulate an adjacent nerve or muscle as desired.

An analysis of the manner in which the circuit disclosed in Crowe et al. operates reveals that the circuit is nothing more nor less than a current steering circuit. That is, by controlling the status of the switches 110 and 112 (FIG. 10) or the equivalent switches shown in the circuits of FIGS. 9 or 11, each electrode can be made to operate as a single anode, a shared anode, a single cathode, or a shared cathode, or as neither, thereby forcing different amounts of current to be sourced from (when operating as an anode) or sunk to (when operating as a cathode) each electrode. And, because (as is well known in the art) "different types of nerves have different trigger characteristics", col. 4, lines 4-5, Crowe et al. teach that one can, through controlled operation of the switches, achieve different spatial and/or time summation of the anode-cathode currents in order to trigger stimulation of a desired nerve while excluding stimulation of undesired nerves. See, e.g., the various examples of switch and time conditions depicted in Tables 1, 2 and 3.

However, Applicant's claimed invention has nothing to do with current steering, or with configuring a switched output configuration to cause different amounts of stimulus currents to flow into or out of selected electrodes. Rather, Applicant's invention is about determining which stimulation level to use on each electrode without having to measure a response at each electrode. Crowe et al. do not show or suggest any way to do this. Using the circuits and methods of Crowe et al., one would still have to know what the response is at each electrode so that a determination could be made if a desired response was achieved.

By way of the present amendment, Applicant has amended claims 1 and 10 (the independent claims) to emphasize that the invention is not about a neural stimulation circuit that provides stimulus currents (although obviously some type of neural stimulation circuit must still be used), but rather is about *normalizing the charge* that is applied through each electrode so responses at each electrode do not have to be measured, as is common in the art. Support for these amendments is found throughout the specification and drawings, and in particular see the title, paragraphs [0005]-[0007], [0024], [0034], and [0038].

Because Crowe et al. do not show or suggest the invention as claimed, it is respectfully submitted that the claims should be in condition for allowance. An indication of allowability at an early date is earnestly solicited.

Conclusion

In view of the foregoing, it is respectfully submitted that the rejections should be removed and that the pending claims are in condition for allowance. An indication of allowability of Claims 1-7 and 10-16 at an early date is thus earnestly solicited.

The Examiner is invited to telephone the undersigned, Bryant R. Gold, should any issues remain after consideration and entry of this response, in order to permit early resolution of such issues.

Respectfully Submitted,

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/BryantRGold/

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